

WHAT IS CLAIMED IS:

1. An ingestible device, comprising:
 - (a) a sink mechanism for generating a net influx of at least one constituent-of-interest present in a gastrointestinal tract of an individual; and
 - (b) a confining mechanism for confining said sink mechanism in a predetermined confinement, hence directing said net influx is into said confinement.
2. The device of claim 1, wherein said net influx generated by said sink mechanism is substantially higher than a net influx generated by a concentration difference of said at least one constituent-of-interest devoid of said sink mechanism, said concentration difference being the difference between concentrations of said at least one constituent-of-interest in and out of said predetermined confinement.
3. The device of claim 1, wherein said sink mechanism is selected from the group consisting of a sink material and a sink device.
4. The device of claim 3, wherein said sink material is for absorbing said at least one constituent-of-interest.
5. The device of claim 4, wherein said sink material is selected from the group consisting of a high affinity sink material, a low affinity sink material and a combination of a high affinity sink material and a low affinity sink material.
6. The device of claim 5, wherein said high affinity sink material is selected from the group consisting of an antibody, whereby said constituent-of-interest is an antigen, a receptor whereby said constituent-of-interest is a ligand, a ligand whereby said constituent-of-interest is a receptor, an enzyme whereby said constituent-of-interest is an inhibitor, an inhibitor whereby said constituent-of-interest is an enzyme and a lectin whereby said constituent-of-interest is a saccharide.
7. The device of claim 5, wherein said low affinity sink material is selected from the group consisting of a nutritional fiber, a clay and a resin.

8. The device of claim 3, wherein at least a portion of said sink material is attached to a solid phase.

9. The device of claim 3, wherein said sink material is water soluble.

10. The device of claim 3, wherein said sink material is water non-soluble.

11. The device of claim 3, wherein said sink material comprises beads.

12. The device of claim 3, wherein said sink material comprises a polymer.

13. The device of claim 3, wherein said sink material comprises an inert solid phase to which affinity sink molecules are attached.

14. The device of claim 3, wherein said sink material is for converting said at least one constituent-of-interest.

15. The device of claim 14, wherein said converting said at least one constituent-of-interest comprises an anabolic process.

16. The device of claim 14, wherein said converting said at least one constituent-of-interest comprises a catabolic process.

17. The device of claim 14, wherein said sink material is a catalyst.

18. The device of claim 14, wherein said catalyst is water soluble.

19. The device of claim 14, wherein said catalyst is attached to a solid phase.

20. The device of claim 17, wherein said catalyst is an anabolic catalyst for accelerating an anabolic process of said constituent-of-interest in said predetermined confinement.

21. The device of claim 20, wherein said anabolic process involves at least two constituents of said gastrointestinal tract.

22. The device of claim 20, further comprising a substance participating in said anabolic process.

23. The device of claim 17, wherein said catalyst is a catabolic catalyst for accelerating a catabolic process of said constituent-of-interest in said predetermined confinement.

24. The device of claim 23, wherein said catabolic catalyst is selected from the group consisting of an esterase, a peptidase, a lipase, a saccharidase, a DNase and an RNase.

25. The device of claim 17, wherein said catalyst is selected from the group consisting of an enzyme and a chemical catalyst.

26. The device of claim 14, wherein said sink material comprises an oxidant for oxidizing said constituent-of-interest.

27. The device of claim 14, wherein said sink device comprises a reductant for reducing said constituent-of-interest.

28. The device of claim 14, wherein said sink material is a living organism.

29. The device of claim 28, wherein said living organism is selected from the group consisting of a bacterium, a unicellular parasite, a multicellular parasite and a fungus.

30. The device of claim 29, wherein said fungus is a yeast.

31. The device of claim 28, further comprising a selective membrane for allowing a preferred influx of said at least one constituent-of-interest.

32. The device of claim 3, wherein said sink device is for converting said at least one constituent-of-interest.

33. The device of claim 32, wherein said conversion of said at least one constituent-of-interest is selected from the group consisting of chemical conversion, mechanical conversion and electrical conversion of said at least one constituent-of-interest.

34. The device of claim 32, wherein said sink device is an electrical sink device.

35. The device of claim 32, further comprising a power source.

36. The device of claim 32, wherein said sink device comprises an oxidation-reduction system.

37. The device of claim 36, wherein said oxidation-reduction system comprises electrodes and a power source.

38. The device of claim 32, further comprising a selective membrane for allowing preferred influx of said at least one constituent-of-interest.

39. The device of claim 1, further comprising a mixing mechanism for actively mixing a content of said predetermined confinement and/or the surroundings of the device.

40. The device of claim 39, wherein said mixing mechanism comprises a heating device.

41. The device of claim 39, wherein said mixing mechanism comprises a mechanical mixer and a power source for operating said mixer.

42. The device of claim 39, wherein said mixing mechanism comprises a sound wave generator.

43. The device of claim 1, further comprising a flow generating mechanism for actively generating a flow of gastrointestinal fluids through said predetermined confinement.

44. The device of claim 43, wherein said flow generating device is a pump.

45. The device of claim 1, wherein said confining mechanism comprises a housing.

46. The device of claim 45, wherein said housing is composed of a bioresistant material.

47. The device of claim 3, wherein said confining mechanism comprises linkers linking among molecules of said sink material, thereby forming a molecular mesh structure.

48. The device of claim 45, wherein said housing is designed and constructed so as to prevent damage to said sink mechanism by constituents of said gastrointestinal tract.

49. The device of claim 45, wherein said housing is designed and constructed so as to prevent damage to said gastrointestinal tract by the sink mechanism.

50. The device of claim 1, further comprising a substance for maintaining a predetermined pH level within said predetermined confinement.

51. The device of claim 45, wherein said housing is configured for expanding and/or contracting.

52. The device of claim 1, made detectable by at least one detection method for detecting the device in said gastrointestinal tract.

53. The device of claim 52, wherein said at least one detection method is non-invasive.

54. The device of claim 52, wherein said at least one detection method is imaging.

55. The device of claim 52, wherein said at least one detection method is selected from the group consisting of x-ray imaging, magnetic resonance imaging, ultrasound imaging, gamma-gamma imaging and automatic tracking.

56. The device of claim 1, further comprising a protective cover made of a biodegradable material, said protective cover being design and constructed to degrade only when arriving to a predetermined location of said gastrointestinal tract.

57. The device of claim 1, wherein said at least one constituent-of-interest is selected from the group consisting of a toxin, creatinine, uric acid, a hepatic toxic metabolite, alcohol, an alcohol metabolite, an electrolyte, a therapeutic or a medicinal agent, a detergent, a renal metabolite, a poisonous substance, a nutritional substance, a biochemical compound and a heavy metal.

58. A method of removing or converting at least one constituent-of-interest present in a gastrointestinal tract of an individual, the method comprising providing the ingestible device of claim 1, and prompting ingestion of the ingestible device, thereby removing or converting the at least one constituent-of-interest.

59. A method of removing or converting at least one constituent-of-interest present in a gastrointestinal tract of an individual, the method, comprising

(a) generating net influx of the at least one constituent-of-interest, using a sink mechanism; and

(b) confining said sink mechanism and the at least one constituent-of-interest in a predetermined confinement;
thereby removing or converting the at least one constituent-of-interest.

60. The method of claim 59, wherein said net influx generated by said sink mechanism is substantially higher than a net influx generated by a concentration difference of said at least one constituent-of-interest devoid of said sink mechanism, said concentration difference being the difference between concentrations of said at least one constituent-of-interest in and out of said predetermined confinement.

61. The method of claim 59, wherein said sink mechanism is selected from the group consisting of a sink material and a sink device.

62. The method of claim 61, wherein said generating said net influx is by absorbing said at least one constituent-of-interest.

63. The method of claim 62, wherein said sink material is selected from the group consisting of a high affinity sink material, a low affinity sink material and a combination of a high affinity sink material and a low affinity sink material.

64. The method of claim 63, wherein said high affinity sink material is selected from the group consisting of an antibody, whereby said constituent-of-interest is an antigen, a receptor whereby said constituent-of-interest is a ligand, a ligand whereby said constituent-of-interest is a receptor, an enzyme whereby said constituent-of-interest is an inhibitor, an inhibitor whereby said constituent-of-interest is an enzyme and a lectin whereby said constituent-of-interest is a saccharide.

65. The method of claim 63, wherein said low affinity sink material is selected from the group consisting of a nutritional fiber, a clay and a resin.

66. The method of claim 61, wherein at least a portion of said sink material is attached to a solid phase.

- 67. The method of claim 61, wherein said sink material is water soluble.
- 68. The method of claim 61, wherein said sink material is water non-soluble.
- 69. The method of claim 61, wherein said sink material comprises beads.
- 70. The method of claim 61, wherein said sink material comprises a polymer.
- 71. The method of claim 61, wherein said sink material comprises an inert solid phase to which affinity sink molecules are attached.
- 72. The method of claim 61, wherein said converting said at least one constituent-of-interest is by an anabolic process.
- 73. The method of claim 61, wherein said converting said at least one constituent-of-interest comprises is by a catabolic process.
- 74. The method of claim 61, wherein said sink material is a catalyst.
- 75. The method of claim 61, wherein said catalyst is water soluble.
- 76. The method of claim 61, wherein said catalyst is attached to a solid phase.
- 77. The method of claim 74, further comprising accelerating an anabolic process of said constituent-of-interest in said predetermined confinement.
- 78. The method of claim 77, wherein said anabolic process involves at least two constituents of said gastrointestinal tract.

79. The method of claim 77, further comprising providing a substance for participating in said anabolic process.

80. The method of claim 74, further comprising accelerating a catabolic process of said constituent-of-interest in said predetermined confinement.

81. The method of claim 80, wherein said accelerating said catabolic process catalyst is by a catabolic catalyst selected from the group consisting of an esterase, a peptidase, a lipase, a saccharidase, a DNase and an RNase.

82. The method of claim 74, wherein said catalyst is selected from the group consisting of an enzyme and a chemical catalyst.

83. The method of claim 61, further comprising oxidizing said constituent-of-interest.

84. The method of claim 61, further comprising reducing said constituent-of-interest.

85. The method of claim 61, wherein said sink material is a living organism.

86. The method of claim 85, wherein said living organism is selected from the group consisting of a bacterium, a unicellular parasite, a multicellular parasite and a fungus.

87. The method of claim 86, wherein said fungus is a yeast.

88. The method of claim 85, further comprising using a selective membrane for allowing a preferred influx of said at least one constituent-of-interest.

89. The method of claim 61, wherein said sink device is an electrical sink device.

90. The method of claim 61, further comprising oxidizing or reducing said at least one constituent-of-interest using an oxidation-reduction system.

91. The method of claim 90, wherein said oxidation-reduction system comprises electrodes and a power source.

92. The method of claim 61, further comprising using a selective membrane for allowing preferred influx of said at least one constituent-of-interest.

93. The method of claim 59, further comprising actively mixing a content of said predetermined confinement and/or the surroundings of the device.

94. The method of claim 93, wherein said mixing is by a heating device.

95. The method of claim 93, wherein said mixing is by a mechanical mixer and a power source for operating said mixer.

96. The method of claim 93, wherein said mixing is by a sound wave generator.

97. The method of claim 59, further comprising actively generating a flow of gastrointestinal fluids through said predetermined confinement.

98. The method of claim 97, wherein said generating flow is by a pump.

99. The method of claim 59, wherein said confining is by a housing.

100. The method of claim 99, wherein said housing is composed of a bioresistant material.

101. The method of claim 61, wherein said confining is by linkers linking among molecules of said sink material, thereby forming a molecular mesh structure.

102. The method of claim 59, further comprising maintaining a predetermined pH level within said predetermined confinement.

103. The method of claim 99, wherein said housing is configured for expanding and/or contracting.

104. The method of claim 59, further comprising detecting the device in said gastrointestinal tract, by at least one detection method.

105. The method of claim 104, wherein said at least one detection method is non-invasive.

106. The method of claim 104, wherein said at least one detection method is imaging.

107. The method of claim 104, wherein said at least one detection method is selected from the group consisting of x-ray imaging, magnetic resonance imaging, ultrasound imaging, gamma-gamma imaging and automatic tracking.

108. The method of claim 59, wherein said at least one constituent-of-interest is selected from the group consisting of a toxin, creatinine, uric acid, a hepatic toxic metabolite, alcohol, an alcohol metabolite, an electrolyte, a therapeutic or a medicinal agent, a detergent, a renal metabolite, a poisonous substance, a nutritional substance, a biochemical compound and a heavy metal.